SAMPLING, ANALYSIS AND QUALITY ASSURANCE PLAN FOR BAYONNE BARREL & DRUM

Prepared for:

United States Environmental Protection Agency
Region II - Removal Action Branch
Edison, New Jersey

Prepared by:

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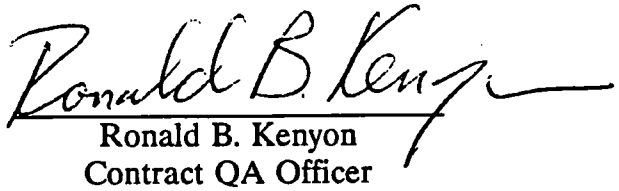
Trenton, New Jersey



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Contract QA Officer

July 18, 1994
OHM Project 16441-2R-035

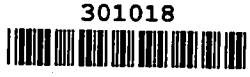


TABLE OF CONTENTS

SECTION 1.0
INTRODUCTION

This document has been prepared to guide the sampling and analytical tasks necessary for the removal action at the Bayonne Barrel and Drum site in Newark, New Jersey. The work has been authorized by Delivery Order 2001-02-039 of the U.S. EPA Emergency Response Contract 68-S3-2001.

All field sampling, documentation, field analysis and sample management for this project will be conducted by OHM's field analytical group. In preparing this Sampling and Analysis Plan (SAP), OHM has utilized the following documents:

U.S.E.P.A. AUGUST 1987--Compendium of Field Operations Methods. Oswer No. 9335.0-14

U.S.E.P.A. APRIL 1990--QA/QC Guidance for Removal Activities, Oswer No. 9350.4-01

U.S.E.P.A.--Sampling for Hazardous Materials

U.S.E.P.A. May 1989--RCRA Facility Investigation Guidance

N.J.D.E.P.E. MAY 1992--Field Sampling Procedures Manual

1.1 SITE HISTORY

Bayonne Barrel and Drum (BBD) is located at 150-154 Raymond Boulevard in Newark, Essex County, New Jersey BBD occupies approximately 15 acres of Block 5002, Lots 3 and 14. The site, formerly the location of a drum reconditioning facility, is bounded by Raymond Boulevard and an exit ramp from Routes 1 and 9 to the north and west, an entrance ramp to the New Jersey Turnpike to the east and south, and the parking lot of a movie theater to the south west (see Figure 1). The nearest residential area to the site is approximately one-half mile away. BBD operated as an unlicensed TSD facility from the early 1940's until the early 1980's when the company filed for bankruptcy under Chapter 11.

According to an EPA Environmental Services Division report from when the facility was operating, drum cleaning operations involved both closed head and open head drums. In closed head cleaning, chains and a caustic solution were used to wash out previous material in the drums. The spent solution drained through an oil-water separator into a 5,000 gallon underground holding/settling tank and was then pumped into a 60,000 gallon aboveground holding/settling tank. The liquid was decanted to the sewer under a permit to the Passaic Valley Sewage Commission. Open head drums were placed on a conveyor belt and moved through the incinerator which burned residue out of the inside. This residue material was collected in two subsurface holding/settling tanks adjacent to the incinerator. Approximately, 4,000 pounds of incinerator ash and sludge were reportedly generated monthly.

Currently, all of the original buildings which existed during the facilities operations remain standing. There are three vertical storage tanks, underground storage tanks, ash piles (approximately 1,600 cubic yards), shredded tires, 300-350 drums and an ash pile in one of the buildings, and 45,000 RCRA empty drums in the field, several of which contain materials.

SECTION 2.0
SAMPLING AND ANALYSIS TASKS

2.1 OBJECTIVES

OHM has identified the following sampling and analytical tasks as necessary for the successful removal action at the Bayonne Barrel and Drum site. A detailed discussion of the technical approach to these identified tasks is presented subsequent to this overview.

- Sample collection, field haz-cat analysis, field test bulking and laboratory analysis of approximately 400 drums of waste
- Sample collection and laboratory analysis of soils associated with the drum storage areas if needed

2.2 CONTAINERIZED WASTE SAMPLING

Sampling of containerized waste will occur only after the container has been evaluated from a health and safety stand point. Containers which appear bulged or under pressure will be remotely opened. Any previous records, container content labels or manufactures labels will be consulted before opening any container.

Initial container condition and physical waste descriptions are conducted by the OHM sampling team and recorded on the Drum Inventory Log. The container is also assigned a unique I.D. numbers for future reference at this time. This log is also used to enter the results of the field compatibility testing. The OHM Drum Inventory Log is presented as Figure 2.1.

2.2.1 Liquid Wastes

Liquids in a container will be sampled using 4 foot sections of glass tubing or pipette (8 to 12 mm ID). The pipette is slowly lowered into the drum. When the bottom of the drum is reached, the sampler places a thumb over the end of the pipette and retrieves it. Any liquid or sludge layering in the container should now be apparent as the tube is brought up. The contents of the tube are then released into an 8-ounce sample bottle. The process is repeated until sufficient sample has been collected. Sludge or solids underneath a liquid may be sampled by forcing the pipette into it. If the sludge does not run out into the jar, shaking the pipette or tapping it against the side of the bottle may loosen the sample. If this fails, one may break the pipette and put the pieces which have the solid in them in the bottle.

2.2.2 Solid And Semi-Solid Wastes

Solids in a container will be sampled with a disposable inert sample scoop. The sample will then be transferred to a pre-cleaned clear glass 8-ounce wide mouth sample container. If the material must be broken up prior to sampling, a brass hammer and chisel will be used. If the material is too elastic, a piece will be cut off with a razor knife. Reusable sampling tools used will be decontaminated between drums.

OHM Remediation Services Corporation	DRUM INVENTORY LOG	DRUM NO.: 002 PROJECT NO.: 16201

PROJECT LOCATION: MGM Textiles Industries LOGGER: J Romeo DATE: 5/23/94

PROJECT CONTACT: Thomas O'Hara SAMPLER: D Radu

PHONE: 609/588-6396 WEATHER: SUNNY

DRUM TYPE ☐ FIBER ☐ POLY-LINED ☒ STEEL ☐ POLY ☐ STAINLESS STEEL ☐ NICKEL

LID TYPE ☒ RINGTOP ☐ CLOSED TOP

DRUM CONDITION ☐ MEET DOT SPEC. ☐ GOOD ☐ FAIR ☒ POOR

DRUM SIZE ☐ 110 ☐ 85 ☒ 55 ☐ 42 ☐ 30 ☐ 16 ☐ 10 ☐ 5 ☐ OTHER

DRUM CONTENTS ☒ FULL ☐ 3/4 ☐ 1/2 ☐ 1/4 ☐ <1/4 ☐ MT

OVERPACKED ☐ NO ☒ YES OVERPACK TYPE ☐ FIBER ☐ STEEL ☒ POLY O.P. SIZE ☐ 55 ☒ 85 ☐ 90 ☐ 110

LAYER	PHYS. STATE	COLOR	CLARITY	LAYER THIKNESS INCHES
Single	SOLID	BRN	OPAQUE	

FIELD ANALYSIS

pH: PID: ppm

DOSIMETER:

OTHER:

DRUMS LABELS/MARKINGS

DOT HAZ UN/NA:

MFG NAME:

CHEMICAL NAME:

ADDITIONAL INFORMATION: GK-51

DRUM COMPATABILITY DATA

☒ OK MARK IF THE PHYSICAL STATE AND COLOR MATCHES THE ABOVE INFORMATION. IF NOT, STOP ANALYSIS AND NOTIFY PROJECT CONTACT. FURTHER WORK WILL NOT BE PAID FOR.

DRUM CAT: BNSol

ANALYSTS: Ken Klinger

DATE PERFORMED: 5/24/94

LAYER	PHYS. STATE	COLOR	CLAR	W.SOL	DENSITY	REACT	pH	HEX.SOL	PER	OXID	CN	SUL	BLSTN	FP	PCB	LAYER CLASS
Single	Solid	BRN	OPAQUE	PS	H	-	7.0	I	-	-	-	-	-	-		BNSol

COMMENTS:

PCB CONC.: ppm FLASH PT.: F

DATA REVIEWER:

FIELD REVIEWER:

TRANSFER NUMBER

COMPAT. COMP.BULK#:

DATA REVIEW DATE:

FIELD REVIEW DATE:

	TRANSFERS RELINQUISHED BY	TRANSFERS ACCEPTED BY	DATE	TIME

OHM Corp. - We make the world a better place.

2.2.3 Rinsewaters

Containerized rinse waters generated during site activities will be sampled at the completion of the project. Grab sampling directly from a valve or sample port on the holding tank is the preferred method of sample collection. If this not feasible, or phased contents are discovered in the holding tank, sampling will occur using a stainless steel bacon bomb sampler or chemically inert bottom filling bailer.

2.3 FIELD HAZ-CAT ANALYSIS

Subsequent to the collection of discreet samples from each container, field haz-cat analysis for the initial waste hazards will occur, followed by a bench scale bulking exercise of chemically similar wastes. Following is an overview of OHM's compatibility procedures.

OHM will perform haz-cat analysis on each layer of every sample obtained. Haz-cat analysis is performed to separate and classify the material into compatible groups. Each sample analyzed will be separated into one of the classifications presented in Figure 2.2.

Following is an overview of the field analysis procedures OHM will employ for preliminary hazard identification of the site wastes. Not all procedures are run on each sample, the field chemist will proceed to an endpoint as guided by the testing scheme presented in Figure 2.2.

2.3.1 OHM Hazcat Procedures

The following tests are performed by the on-site OHM chemist:

Water solubility The solubility of the sample in water is determined by adding 1-ml distilled/de-ionized (DI) water to 1-gram sample, in a 12-mm x 100-mm culture tube. The contents are stirred using a vortex mixer.

- The results are recorded as positive (water soluble), partially soluble, slightly soluble, or negative (water insoluble).

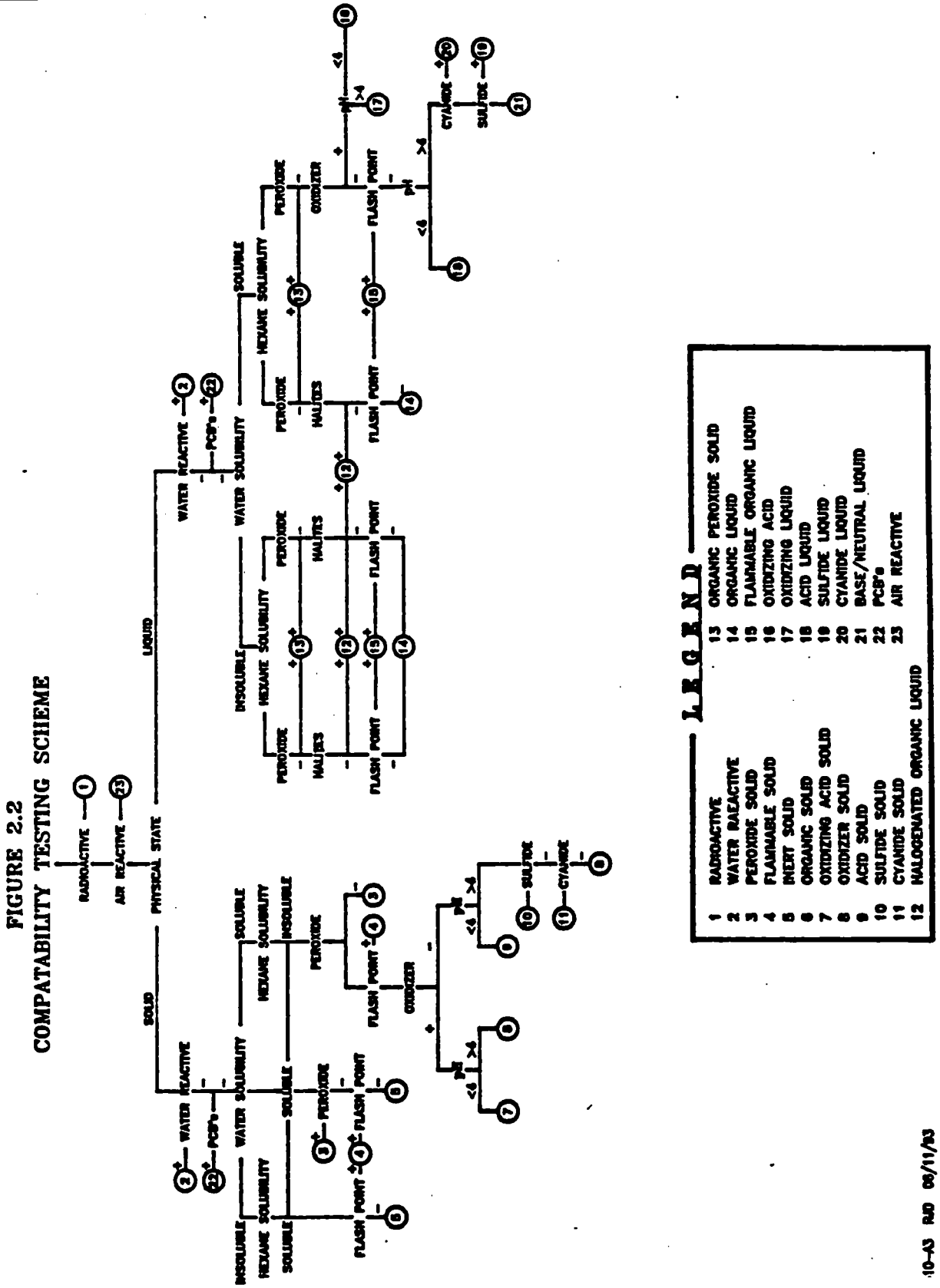
pH The pH of the aqueous layer is determined using Baxter (or similar manufacturer) pH test strips.

- The color change on the strip is compared to a color-chart supplied by Baxter.
- The pH is determined to an accuracy of +/- one pH unit.
- Samples with a pH less than 4 are classified as acidic.
- Samples with a pH greater than 10 are classified as basic.

Hexane solubility The solubility of the sample in hexane/dichloromethane (50/50) is determined in an analogous method as described for water solubility. The hexane/DCM is prepared prior to the initiation of hazcatting.

- The sample is classified as organic with just the slightest solubility in hexane/DCM. This is to avoid organic material from contaminating an aqueous wastestream.

FIGURE 2.2
COMPATABILITY TESTING SCHEME



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Flash point is determined for samples by the use of seta-flash apparatus.

- The apparatus is calibrated to determine those samples which have a flash point less than or equal to 60 C (140F).
- Samples which are positive are classified as flammable.

Chlorinated compounds are determined by the use of a flame test. Sample is placed within a loop of sterilized copper wire, and immersed into a flame.

- A green flame is positive for chlorine.
- A blue flame is indicative of bromine.

Organic Peroxide The organic layer is tested for peroxides by placing a few drops of sample on a peroxide test strip (commercially available from EM Quant).

- The strip is allowed to dry. A drop of water is added after 30-seconds.
- A color change to blue is an indicator of an organic peroxide.
- The concentration of peroxide can be quantitated by comparison of the blue color to a color scale which accompanies the test strips.

Oxidizing material The presence of an oxidizer is determined by, first, acidifying the sample with glacial acetic acid.

- A few drops of sample are placed on a potassium iodide-starch Test paper (commercially available from EM Quant).
- A dark blue-black color formed within a few seconds is indicative of a strong oxidizer.
- A light-blue color, or color formation which requires up to 5-minutes, is indicative of a weak oxidizer.

Sulfide material The presence of sulfides in a sample is determined using a lead acetate test strip at pH=5.

- A few drops of 2M sodium acetate batter is added to the test strip prior to the sample.
- Formation of a black precipitate (lead sulfide) is a positive test for sulfides.
- Confirmation of sulfides can be made with a cadmium carbonate solution. A yellow precipitate (cadmium sulfide) is a positive result.

Cyanide material The presence of cyanide in a sample is detected by the use of commercially available cyanide test kits (EM Quant).

- 1-gram of sample is diluted to 5-ml with DI water.
- The pH is adjusted to 7-8 by the addition of a measured quantity of phosphate buffer. Dissolution of the buffer is enhanced by stirring on a Vortex mixer.
- 5-drops of pyridine-barbituric acid is added.
- A test strip is immediately immersed into the solution for 30-seconds.

- A positive test for cyanides is indicated by a color change to red on the test strip reaction zone.
- The concentration of cyanide can be approximated upon comparison of the color of the reaction zone to color chart which accompanies the test strip kit.

PCBs If PCBs are suspected, these samples will be composited for analysis by the laboratory. Chlorinated organic liquids which are oil-like, generally, are suspected of PCB-contamination.

- A PCB-screen is performed using a modified-version of EPA/SW-846 Method 8080.
- This procedure can be performed in the OHM mobile laboratory trailer by a qualified gas chromatograph (GC) operator.
- Any PCB material is, first, extracted into with hexane/DCM (50/50), solvent exchanged, cleaned up via acid hydrolysis, then injected into the GC. PCBs are detected with an ECD or Hall detector.
- The detection limit for PCBs for each sample is 25 ppm.

2.4 BENCHSCALE WASTE BLENDING

Following characterization of the samples, a benchscale bulking test of chemically like samples will be conducted. The samples are bulk tested by slowly adding a small proportional aliquot from each sample in the same classification group. Samples from the same compatible group will be bulked in not more than 25 samples per "bulk sample". This bulked composite sample from compatible samples will be submitted for disposal analysis. A five minute waiting period follows each addition, during which the bulked samples are monitored for any gas evolution or exothermic reaction. If a reaction occurs, the bulking test is repeated without the addition of the reactive sample. Upon completion of the benchscale bulk test, the compatible groups are identified. The blending procedure is documented by the chemist using the form presented in Figure 2.3.

By performing compatibility analysis and benchscale bulking tests, OHM reduces the amount of samples that require disposal analysis. This significantly lowers costs while providing an effective means of identifying material for disposal. These tests also provide information for performing on site bulking of wastes for disposal if this method is found to be more cost-effective than individual drum disposal.

2.5 WASTE DISPOSAL ANALYSIS

The data received from the compatibility analysis will be reviewed by OHM's treatability and disposal manager who will determine the most suitable disposal analysis to be performed. This determination will be based on the most cost-effective and feasible method of disposal for each wastestream. Table 2.1 presents the standard lab analyses OHM utilizes for wastes based on the proposed disposal option.

All samples are prepared and analyzed according to SW-846 methods where available. If no SW-846 methods may be applied, another EPA approved method will be used. If no EPA methods are available, a suitable ASTM or APHA method will be used.

Figure 2.3

OHM Corporation

WASTE BLENDING TEST LOG

WASTE STREAM _____

PROJECT NAME:	PROJECT NUMBER:
PROJECT LOCATION:	PROJECT MANAGER:
PROJECT CHEMIST:	BLENDING SUPERVISOR:
DATE BLENDING TEST PERFORMED: / /	PERFORMED BY:
WASTE STREAM NUMBER:	SUPERVISED BY:

CAUTION ALL WASTE BLENDING MUST BE PERFORMED IN LISTED SEQUENCE!

VARIATION FROM THE SEQUENCE ORDER MUST BE APPROVED BY THE PROJECT CHEMIST AND PROJECT SUPERVISOR OR PROJECT MANAGER!

SEQ No	DRUM No.	TEST BLENDING DATA: TEMP RISE °C	GAS EVOL Y	GAS EVOL N	HAZ RXN Y	HAZ RXN N	APPROVED TO BLEND	SEQ No	DRUM No.	TEST BLENDING DATA: TEMP RISE °C	GAS EVOL Y	GAS EVOL N	HAZ RXN Y	HAZ RXN N	APPROVED TO BLEND
1			☐	☐	☐	☐		26			☐	☐	☐	☐	
2			☐	☐	☐	☐		27			☐	☐	☐	☐	
3			☐	☐	☐	☐		28			☐	☐	☐	☐	
4			☐	☐	☐	☐		29			☐	☐	☐	☐	
5			☐	☐	☐	☐		30			☐	☐	☐	☐	
6			☐	☐	☐	☐		31			☐	☐	☐	☐	
7			☐	☐	☐	☐		32			☐	☐	☐	☐	
8			☐	☐	☐	☐		33			☐	☐	☐	☐	
9			☐	☐	☐	☐		34			☐	☐	☐	☐	
10			☐	☐	☐	☐		35			☐	☐	☐	☐	
11			☐	☐	☐	☐		36			☐	☐	☐	☐	
12			☐	☐	☐	☐		37			☐	☐	☐	☐	
13			☐	☐	☐	☐		38			☐	☐	☐	☐	
14			☐	☐	☐	☐		39			☐	☐	☐	☐	
15			☐	☐	☐	☐		40			☐	☐	☐	☐	
16			☐	☐	☐	☐		41			☐	☐	☐	☐	
17			☐	☐	☐	☐		42			☐	☐	☐	☐	
18			☐	☐	☐	☐		43			☐	☐	☐	☐	
19			☐	☐	☐	☐		44			☐	☐	☐	☐	
20			☐	☐	☐	☐		45			☐	☐	☐	☐	
21			☐	☐	☐	☐		46			☐	☐	☐	☐	
22			☐	☐	☐	☐		47			☐	☐	☐	☐	
23			☐	☐	☐	☐		48			☐	☐	☐	☐	
24			☐	☐	☐	☐		49			☐	☐	☐	☐	
25			☐	☐	☐	☐		50			☐	☐	☐	☐	

TO THE BEST OF MY KNOWLEDGE THE INFORMATION GIVEN ON THIS FORM IS CORRECT AND ERROR FREE EXCEPT WHERE NOTED IN THE COMMENTS SECTION.

SIGNATURE (PROJECT CHEMIST) DATE: / /

TABLE 2.1
OHM - GUIDELINES FOR DISPOSAL ANALYSES

PACKAGE A [ALL SAMPLES]	
Analysis	**Method(s)**
Total Solids	160.3
Corrosivity, pH	150.1, 9040, 9045
Flash Pt. Ignitability	1010, 1020
Reactive Sulfide	Sec. 7.3.4.1
Reactive Cyanide	Sec. 7.3.3.2
TCLP Volatile Organics	1311 - 8240, 8260
TCLP Semi-Volatile Organics	1311 - 8270
TCLP Metals	1311 - 6010, 7000's
TCLP Pesticide/Herbicides	1311 - 8080/8015
TCL Volatile Organics	8240, 8260
TCL Semi-Volatile Organics	8270
TCL Pesticide/PCBs	8080
TCL Herbicides	8150
PACKAGE B [INCINERATION DISPOSAL] Package A plus the following:	
% Ash	160.4
BTU	ASTM
Total Halides	9020
Total Sulfur	ASTM
Total Cyanide	9010
TAL Metals and Molybdenum	6010, 7000's
PACKAGE C [LANDFILL DISPOSAL] Package A plus the following:	
Paint Filter Test	9095
Total Cyanide	9010
Total Organic Halogens (TOX)	9020
PACKAGE D [WASTEWATER TREATMENT] Package A plus the following:	
Total Sulfide	3762, 9030
Total Cyanide	9010
Total Phenols	420.1, 9065
TAL Metals and Molybdenum	6010, 7000's

2.6 SOIL SAMPLING AND ANALYSIS

It is not believed that any soils are in need of sampling this point. If soil samples are needed the following will apply.

Sampling of soils will be accomplished using one of two methods:

Surface soils will be sampled using a stainless steel trowel. Since non-volatile species are the analytes of concern, all collected soils will be thoroughly homogenized in a stainless mixing tray before collection into the appropriate laboratory clean container. Documentation and sample management will occur as discussed in Section 4.0.

Subsurface soils will be collected using a stainless hand auger in conjunction with a hydraulic power auger. The power auger will be advanced to the desired depth and removed. A clean hand auger is then inserted into the boring to retrieve to the sample aliquot. Sample handling will occur as discussed previously. All reusable sampling equipment will be decontaminated between each sampling location as discussed in Section 4.8.

Following is a summary of the soil samples OHM proposes for the site:

- OHM will superimpose a 25 feet by 25 feet sampling grid over the excavation floor yielding 20 sample points.
- OHM will collect samples from three depth intervals at each grid point; 0 to 6 inches, 6 to 12 inches, and 12 to 18 inches. The two lower horizon samples will be archived at the laboratory pending results of the 0 to 6 inch samples. Elevated concentrations may warrant analysis of the remaining depths to accurately delineate vertical contamination.
- These post excavation samples will be analyzed for parameters determined by EPA

SECTION 3.0
DATA QUALITY OBJECTIVES

Based on the definitions discussed in Quality Assurance/Quality Control Guidance for Removal Activities, OHM will generate project data meeting the criteria of QA1 and QA2 objectives. Table 3.1 presents the analytical tasks anticipated for the project and the related QA objective.

TABLE 3.1
PROJECT QA/QC OBJECTIVES

QA/QC OBJECTIVE	SITE TASK
QA1	• **Real time air monitoring with PID, LEL, dust monitor** • **Field compatibility analysis (pH, solubility, etc.)**
QA2	• **H&S air samples** • **PCB screening for compatibility analysis** • **Laboratory analysis for disposal criteria**

DELIVERABLES

QA1	QA2A	QA2B	QA3
Field Data ▸	Chain of Custody ▸	Chain of Custody ▸	CLP Type Data Package
▸	Project Narrative	▸ Project Narrative	
	• Date Received/ Date Analyzed	▸ QA/QC Narrative	
	• Methods Used	▸ Field Blank	
		▸ Travel Blank (waters for VOA only)	
	▸ QA/QC Narrative	▸ Field Duplicates (MS, MSD)	
	• Sample/Matrix Problems		
	• Dilutions Required		
	• Elevated D.L.s		

SECTION 4.0
FIELD SAMPLING QA/QC

Sample integrity is a key element in any project. Sample integrity strengthens the validity of the analytical data, and can be used for legal documentation if needed. Sample integrity is maintained by OHM through proper sample collection, documentation, and sampling equipment maintenance.

4.1 SAMPLE LABELS

Correct sample labeling and the corresponding notation of the sample ID numbers in the field logbook are necessary to prevent misidentification of samples and their eventual results. All sample labels will be filled out legibly and with indelible ink. They will be affixed to the sample container and covered with clear tape. Listed below, Figure 4.1, presents an example of a sample label.

FIGURE 4.1
LABEL SAMPLE

PROJECT NO.: DATE:TIME:
SAMPLE:
TAKEN BY:
WITNESS:

The following information is recorded on the label using indelible ink:

- Project number - 16441
- Date--month, day, and year
- Time--Military time (e.g., 1000, 1400, 2320)
- Samples--Description of sample
- Analyte--Analysis which will be performed, if more than one analysis is being done on samples from that project
- Preservative--If used
- Taken By--Initials of person taking sample
- Witness--Initials of person witnessing or assisting in taking sample
- Sample Number--Assigned from laboratory log book. Write number in blank corners of label. Sample numbers will be assigned numerically starting with 001. The OHM project number (16441) will be used as prefix

  Example: 16441

- Number of Jars–Used with duplicate samples or when one jar cannot hold all the sample.

Every sample collected will be labeled in the above manner. Information will be printed neatly, except for initials which can be written. After the sample is collected and the label is securely attached, the sample is logged into the sample log book with the sample number written on the sample label.

4.2 SAMPLE CUSTODY AND HANDLING

An important consideration for the collection of environmental data is the ability to demonstrate that analytical samples have been obtained from predetermined locations and that they have reached the laboratory without alteration. Evidence of collection, shipment, laboratory receipt, and laboratory custody until disposal must be documented to accomplish this. Documentation is accomplished through an Analysis Request and Chain-of-Custody Record that records each sample and the individuals responsible for sample collection, shipment, and receipt. A sample is considered in custody if it is:

- In a person's actual possession
- In view after being in physical possession
- Sealed so that no one can tamper with it after having been in physical custody
- In a secured area, restricted to authorized personnel

Overall, chain-of-custody documentation will begin when laboratory personnel record bottle lot numbers during the transfer of bottles to field personnel. Field personnel will then maintain custody of the bottles until sample collection, at which time they will record in their field notes the lot numbers of all bottles used for each sample. A copy of the lot number information will accompany the samples to the laboratory and will be included in the data packages.

Sample custody will be initiated by field personnel upon collection of samples. Labels and log information will be checked to verify that identification is correct. Samples will be packaged to prevent breakage or leakage during transport. Chain-of-custody information will be supplied with the samples and shipped by commercial carriers. The standard OHM Chain-of-Custody is presented in Exhibit A.

4.3 FIELD DOCUMENTATION

Several types of documentation will be prepared in the field by the project chemist or sampling team in order to record the sampling activities and observations.

4.3.1 Field Note Books Field notes regarding all sampling and field activities will be kept in a bound notebook with pre-numbered pages. Indelible ink will be used for all entries. It will include among other things:

Field parameter observations,
Locations of sampling points and corresponding sample numbers,
Documentation of individual samples comprising the composite samples,
Descriptions of deviations from sampling plan,
Signatures of personnel responsible for observations.

4.4 FIELD MANAGEMENT AND SHIPMENT

Upon collection in the field, samples will be properly labeled as discussed and stored in a cool place away from sunlight. Field samples will tighten all container lids, place each sample container in an approved DOT shippable container which will be used to transport samples to the laboratory. Sufficient incombustible, absorbent, cushioning material will be packed in the shipping container to minimize the possibility of sample container breakage. The DOT shippable containers will be secured using nylon strapping tape and custody seals to ensure that samples have not been disturbed during transport. Samples will be promptly shipped to the laboratory so that they arrive within 24 hours of collection. Transportation of samples must be accomplished not only in a manner designed to protect the integrity of the sample, but also to prevent any detrimental effects from the potentially hazardous nature of the samples.

Regulations for packaging, marking, labeling, and shipping of hazardous materials, substances and wastes are promulgated by the U.S. Department of Transportation (DOT) and described in the 49 CFR 171 through 177. In general, these regulations were not intended to cover the shipment of environmental samples collected at hazardous waste sites. Environmental samples usually contain low concentrations of hazardous substances when compared with most of the concentrated materials regulated by the DOT. However, the U.S. EPA has deemed it prudent to package, mark, label, and ship samples observing these DOT procedures, as appropriate.

4.5 LABORATORY MANAGEMENT OF SAMPLES

Laboratory sample receipt generally discussed in either the laboratory QA/QC manual or a laboratory SOP. The laboratory specific procedure for this project can be provided if needed.

In general, the receiving laboratory's sample custodian will:

- Examine all samples and determine if proper temperature has been maintained during shipment. If samples have been damaged during shipment, the remaining samples will be carefully examined to determine whether they were affected. Any samples affected shall also be considered damaged. It will noted on the Analysis Request and Chain-of-Custody Record that specific samples were damaged and that the samples were removed from the sampling program. Field personnel will be notified as soon as possible that samples were damaged and that they must be resampled, or the testing program changed, and an estimate of the cause of damage.

- Compare samples received against those listed on the Chain-of-Custody Record.

- Verify that sample holding times have not been exceeded.

- Sign and date the Analysis Request and Chain-of-Custody Record and attach the waybill to it.

- Denote the samples in the laboratory sample log-in book with contains the following information:

  - Project identification number
  - Sample numbers
  - Type of samples
  - Date received in laboratory
  - Record of the verified time of sample receipt (VTSR)
  - Date put into storage after analysis is completed
  - Date of disposal

  The last two item will be added to the log when the action is taken.

- Notify the laboratory project manager of sample arrival.

- Place the completed Analysis Request and Chain-of-Custody Records in the project file.

The VTSR is the verified time of sample receipt at the laboratory. The date and time the samples are logged in by the Sample Custodian or designed will agree with the date and time recorded by the person relinquishing the samples. Holding times for the samples associated with this project will begin at the VTSR.

4.6 LABORATORY SAMPLE STORAGE

The primary considerations for sample storage are:

- Maintenance of prescribed temperature, if required, which is typically 4 degrees Celsius

- Extracting and/or analyzing samples within the prescribed holding time for the parameters of interest

The requirements for temperatures and holding times will be followed. Placing of samples in the proper storage environment is the responsibility of the Sample Custodian, or designed, who will notify the Laboratory Group/Team Leaders, or designated representative, if there are any samples which must be analyzed immediately because of holding-time requirements.

4.7 SAMPLE DISPOSAL

The Analysis Request and Chain-of-Custody Record for the sample is completed upon sample disposal.

There are several possibilities for sample disposition:

- The sample may be completely consumed during analysis.
- Samples may be returned to the site for disposal.
- The samples may be stored after analysis. Proper environmental control and holding time must be observed if reanalysis is anticipated. If reanalysis is not anticipated, environmental conditions for storage will not be observed.

4.8 EQUIPMENT DECONTAMINATION

All reusable sampling equipment employed by OHM is thoroughly decontaminated between each sampling location using the following widely accepted protocol:

1. Non-phosphate soap and water rinse
2. Tap water rinse
3. Deionized water rinse
4. 10% nitric acid rinse
5. Deionized water rinse
6. Acetone rinse
7. Air dry
8. Deionized water rise

All decontamination rinsate will be collected on-site prior to proper disposal.

In addition to proper equipment maintenance, latex rubber gloves are worn by OHM sampling personnel and changed between each sampling location.

All sample containers for the project will be pre-cleaned to EPA protocol.

SECTION 5.0
PROJECT ORGANIZATION

All field sampling and data management activities for the project will be conducted by OHM's field analytical group located in Trenton, New Jersey. The project staff will consist of one project chemist and field sampling personnel.

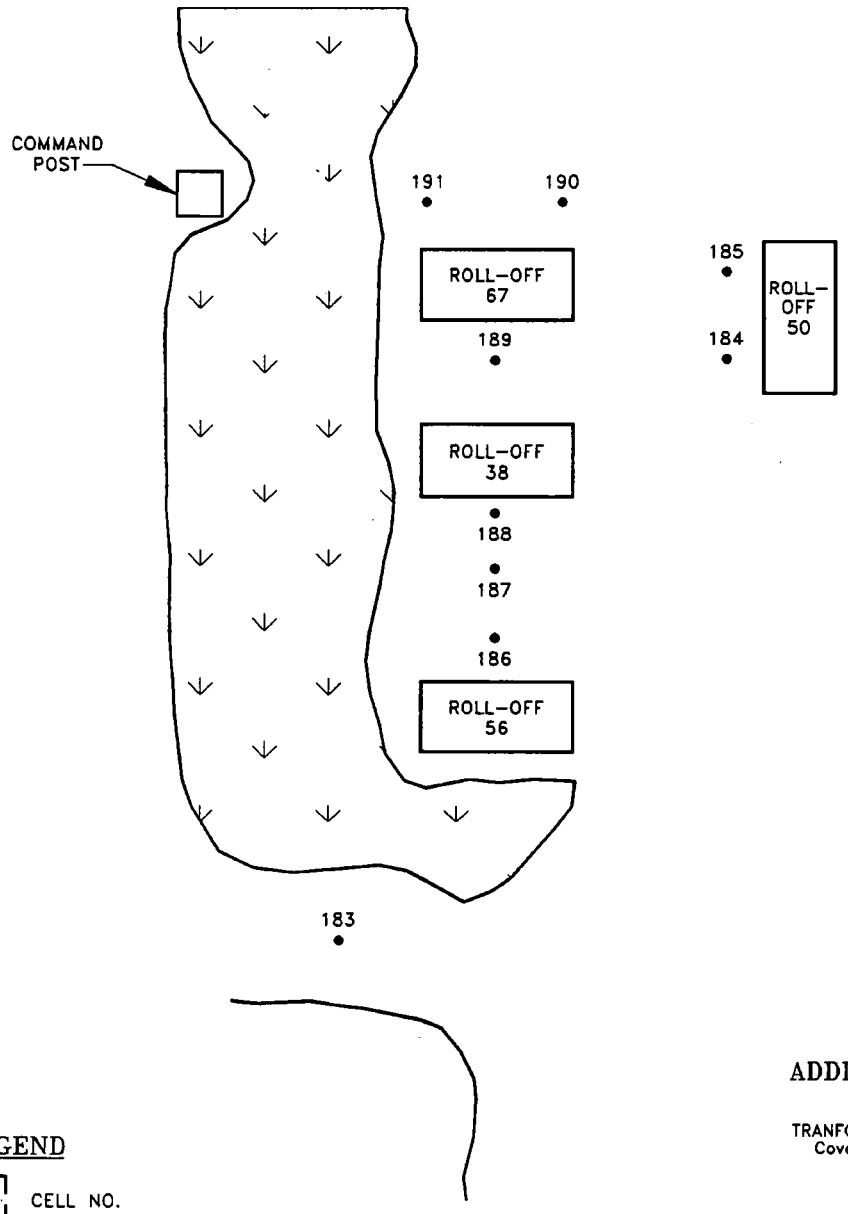
SECTION 6.0
PREVENTATIVE MAINTENANCE AND CORRECTIVE ACTION

Accuracy and precision of both field equipment and laboratory equipment is maintained by OHM through routine maintenance according to the manufacturer's recommendations.

OHM maintains a large inventory of instrumentation and replacement parts in its Northeast Regional shop in Windsor, New Jersey. Backup equipment and replacement parts can be air-shipped overnight to the site if needed. Additional lab chemicals or other field analytical items can also be air-shipped overnight directly from the vendor.

Periodic preventive maintenance is essential for sensitive laboratory analytical instruments. Instrument manuals are kept on file for reference if equipment needs repair. Troubleshooting sections of manuals are often useful in assisting personnel in performing maintenance tasks.

Any equipment requiring routine maintenance will be tagged with a maintenance label indicating the date of required maintenance, the person maintaining the equipment, and the next maintenance date. Information pertaining to life histories of equipment maintenance will be kept in individual equipment history logs with each instrument. Appropriate and sufficient replacement parts of backup equipment will be available so sample and monitoring tasks are not substantially impeded or delayed.



LEGEND

C2 CELL NO.

18 SOIL SAMPLE (SS) NO.

R5 SOIL SAMPLE NO.

AREA 1
ADDITIONAL SAMPLING
CONTINUED

TRANFORMER DISPOSAL AREA SITE
Coventry/West Greenwich, RI

PREPARED FOR

USEPA
Lexington, MA

OHM Project No. 16323
OHM Remediation Services Corp.

16323-A8 JRF 09/15/94 revision 1 MB